Supira MEDICAL

Internship 2022

Ehsan Al-Agtash

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Overview

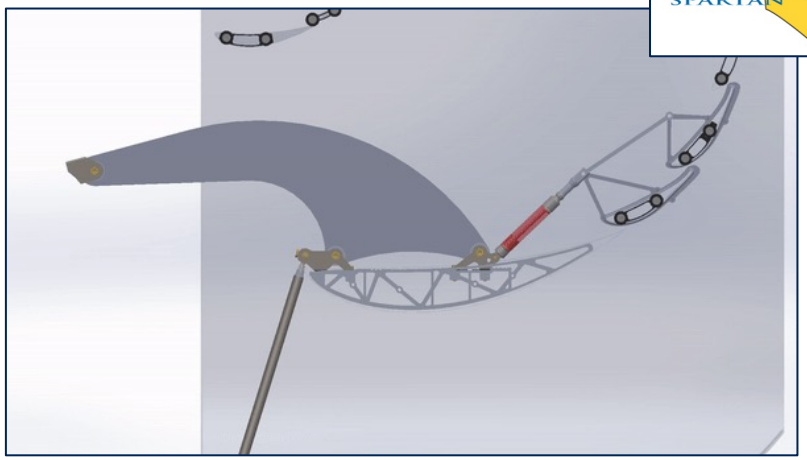
- Introduction
- Projects
- Things I learned
- Takeaways

Introduction

About Me

San José State University
Charles W. Davidson College of Engineering
Department of Mechanical and Aerospace Engineering

- San Jose State University
  - Graduating in December 2022
  - B.S. in Mechanical Engineer
  - Why mechanical?
  - Spartan Racing Team



- Hobbies
  - Surfing
  - Hiking
  - Camping
  - Snowboarding

Projects

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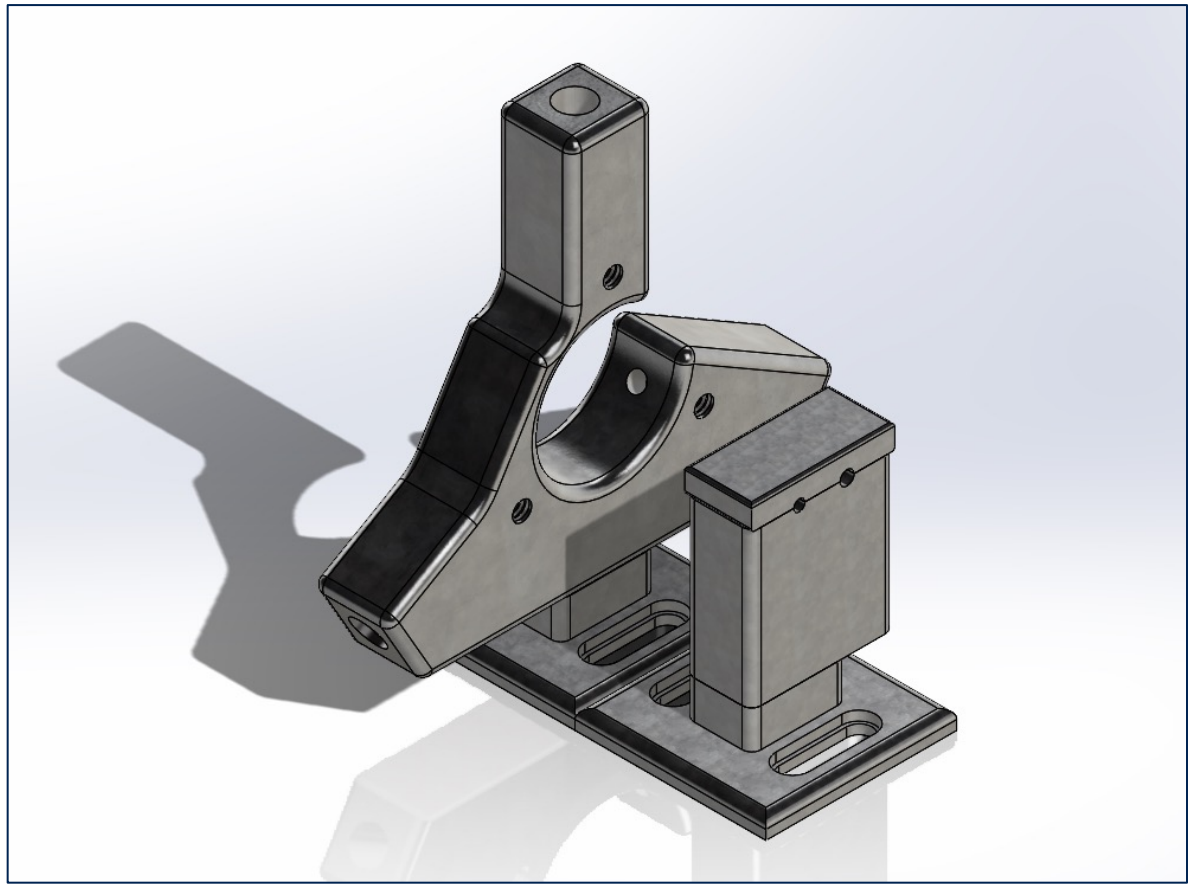
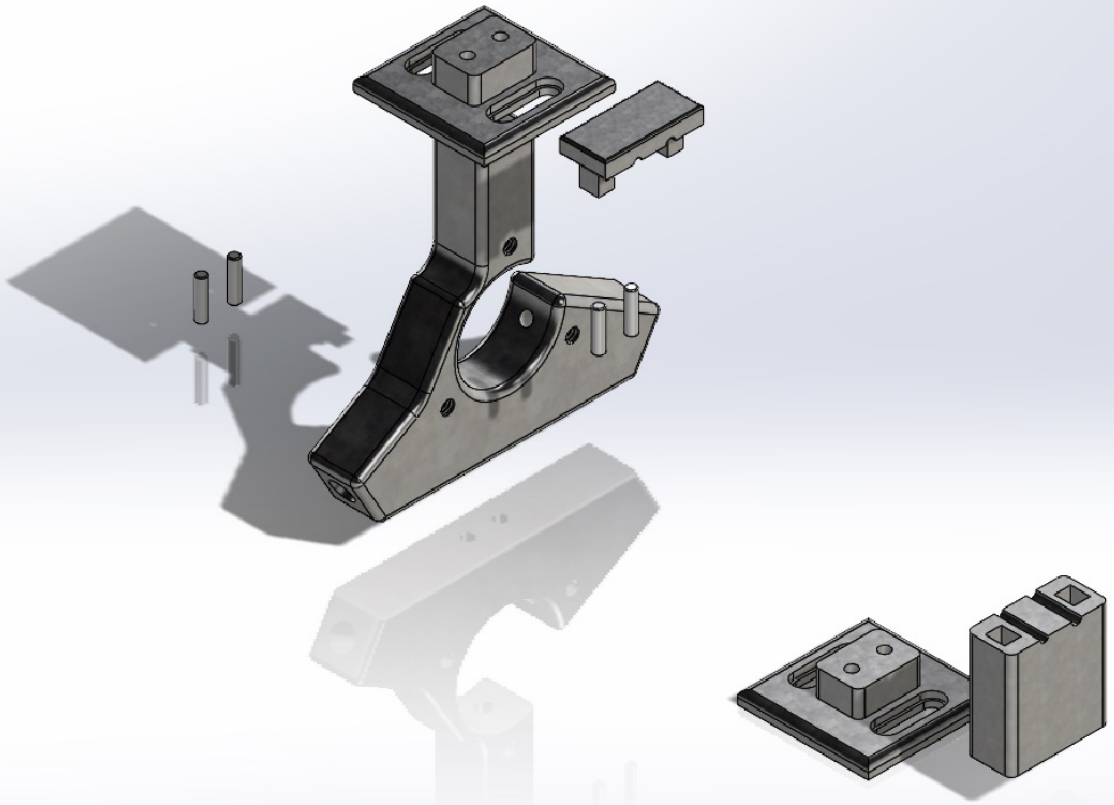
UV curing station



- Problem:
  - Inconsistent results with curing throughout manufacturing
  - Issues of Burning and the adhesive not fully curing
- Challenges:
  - Operator useability
  - Height / Space constraints
  - Cables bending radius

UV curing station



Design

Where it started

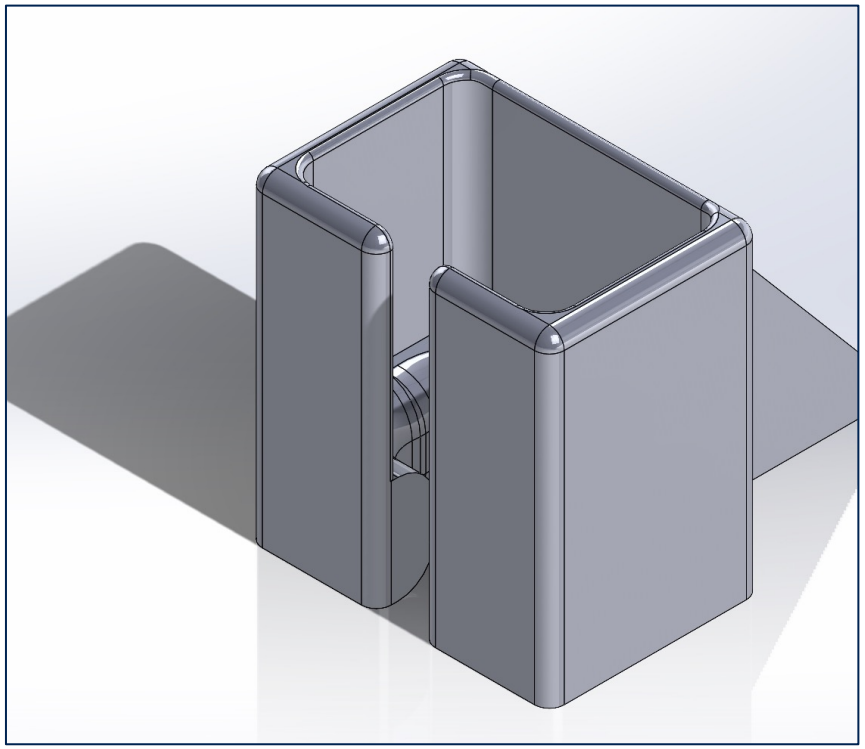
UV curing station

- Testing:
  - DOE to explore process inputs
  - Vary cure time and UV distance
- Other Findings:
  - The storage temp of the Loctite 3311 matters
  - The further the distance the less burn risk
  - Volume of Loctite matters

Distance of the wands being extruded (cm)	Time (seconds)						Tube OD (In)
	2	4	6	8	10	12	
0.5	Not cured	Not cured	Clear/sticky	Clear	Clear	Burnt/bubbly	0.11
0.75	Not cured	Not cured	Clear/sticky	Clear/sticky	Clear/fully cured	Burnt/bubbly	0.11

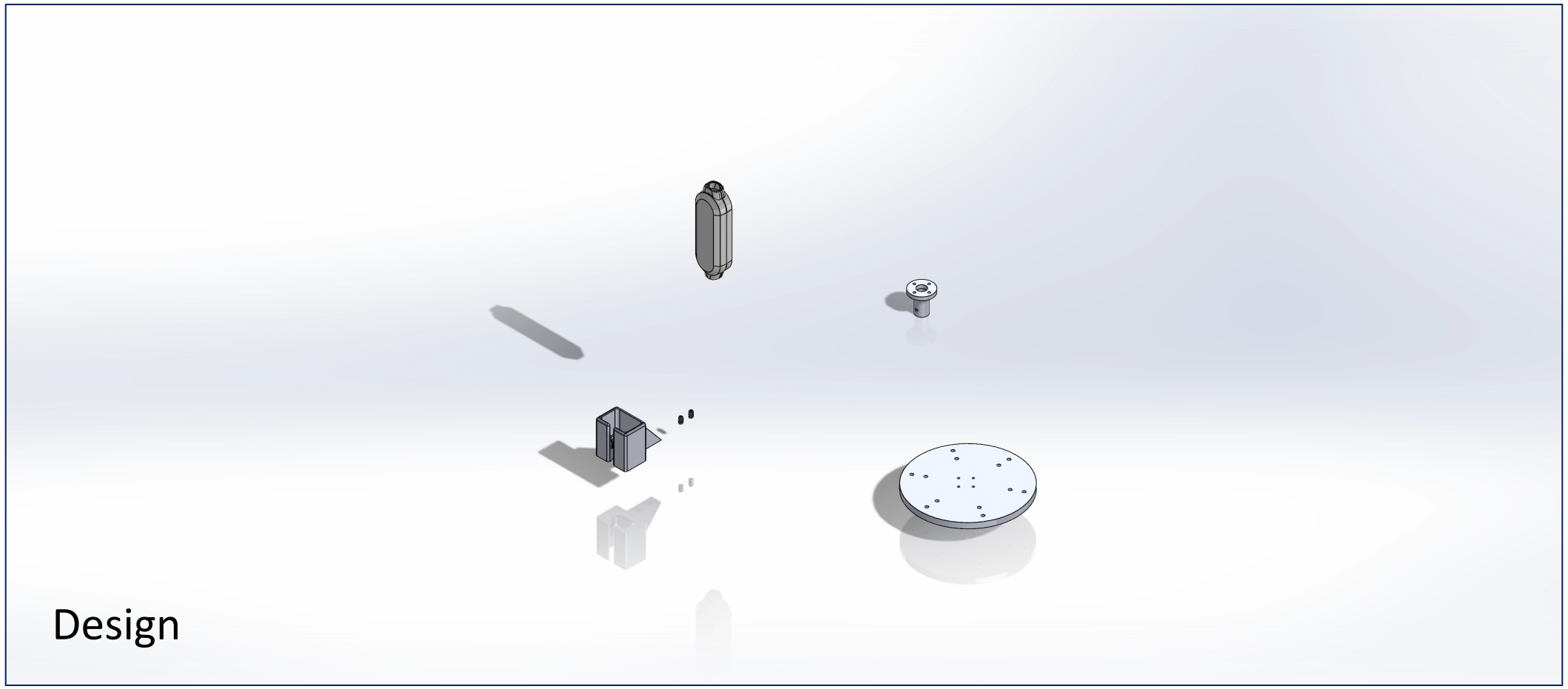
Distance of wands being extruded (cm)	Time (seconds)						Tube OD (In)
	2	4	6	8	10	12	
0.5	Not cured	Not cured	Clear/sticky	Clear/sticky	Clear/sticky	Clear/fully cured	0.14
0.75	Not cured	Not cured	Clear/sticky	Clear/fully cured	Burnt/bubbly	N/A	0.14
1	Not cured	Not cured	Clear/sticky	Clear/sticky	Clear/fully cured	Burnt/Bubbly	0.14

Device Dryer

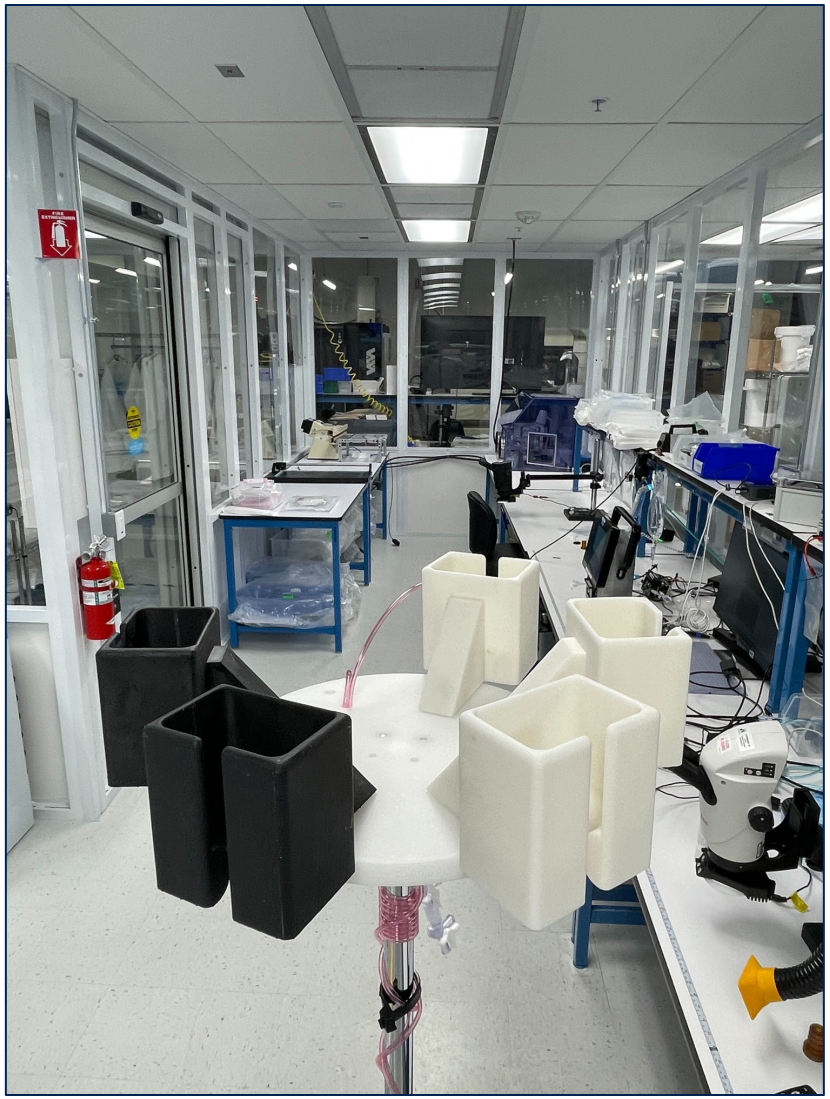


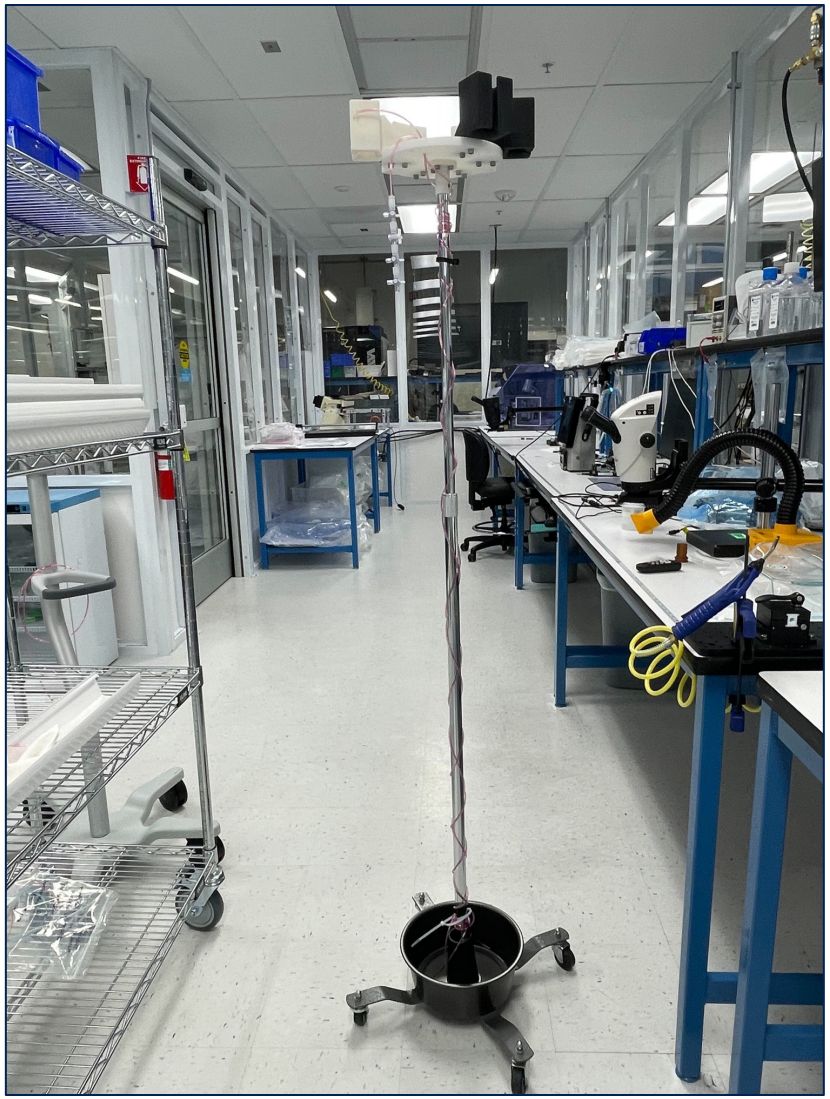
- Problem
  - No where to place Supira device after testing
  - Devices weren’t drying completely
- Challenges
  - Mounting
  - Desk holes weren’t centered
  - Enough room

Device Dryer



Where it's at now

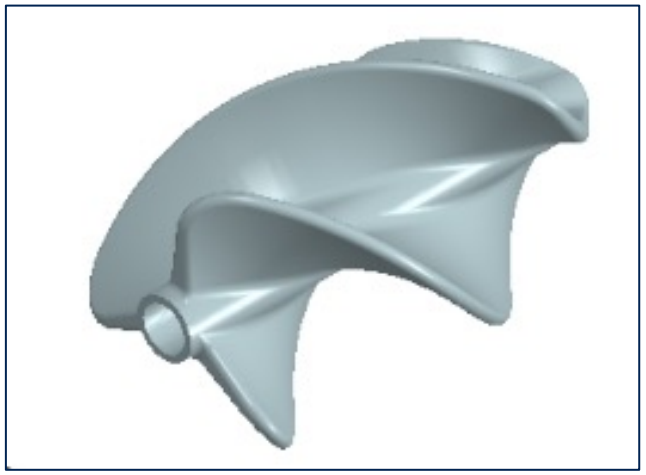




Impeller trimming fixture

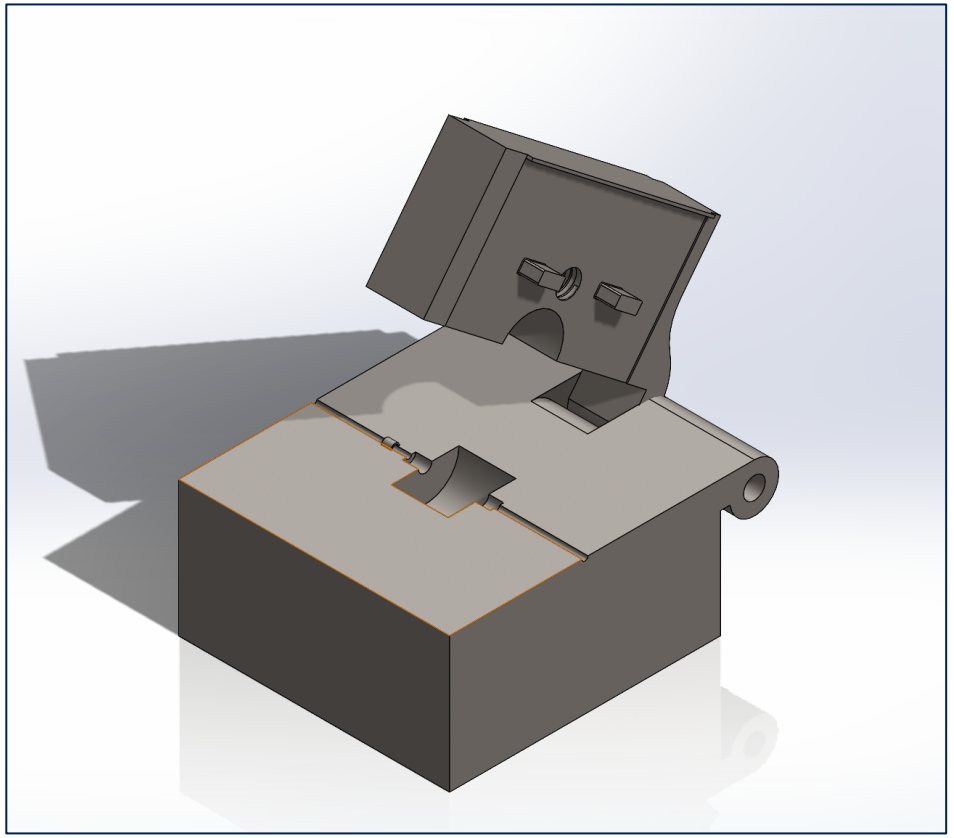
- Problem:
  - Inconsistency of trimming the impellers to the appropriate location

- Challenges:
  - Small part
  - Very tight tolerances
  - Part flexibility
  - Small measurements



Impeller trimming fixture

- Testing:
  - An accurate trim from both sides of the impeller
  - IQ after each trim
- Results:
  - TBD



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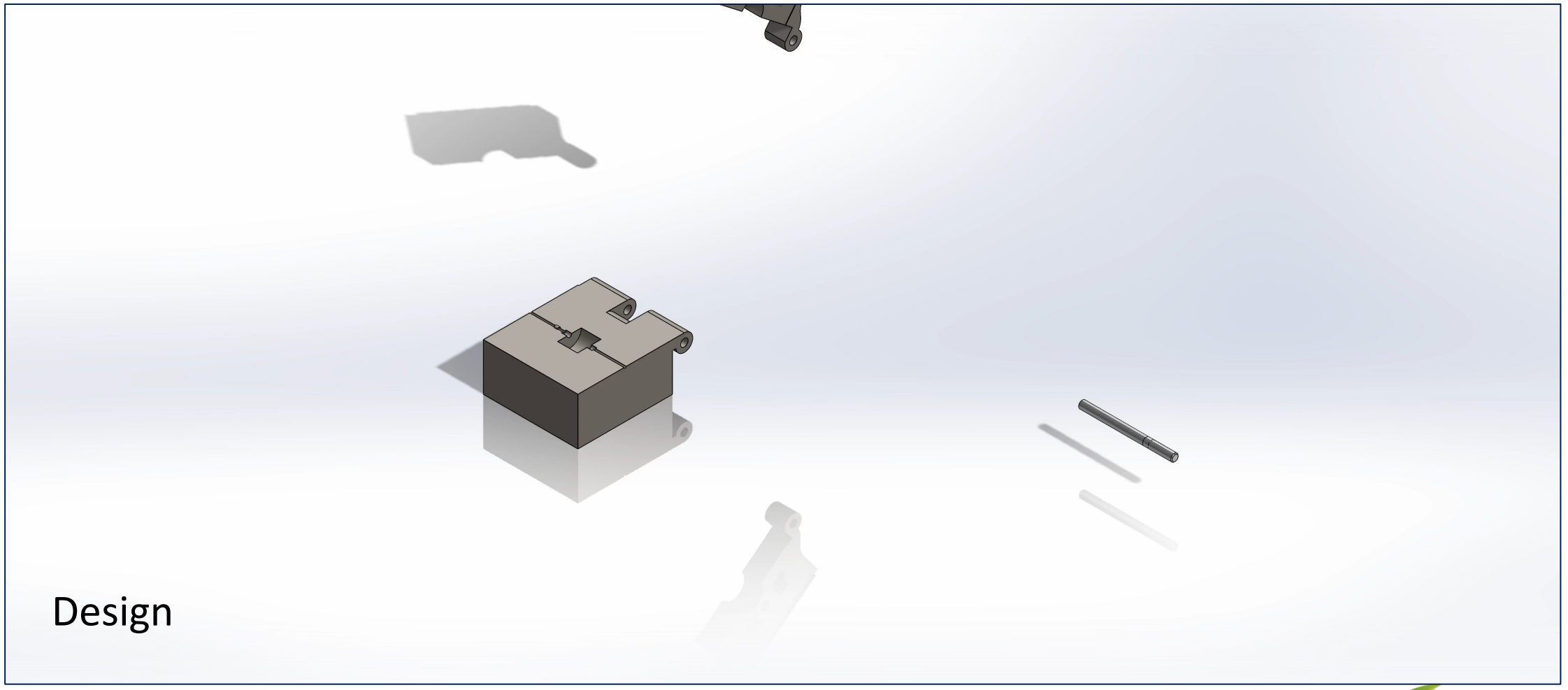
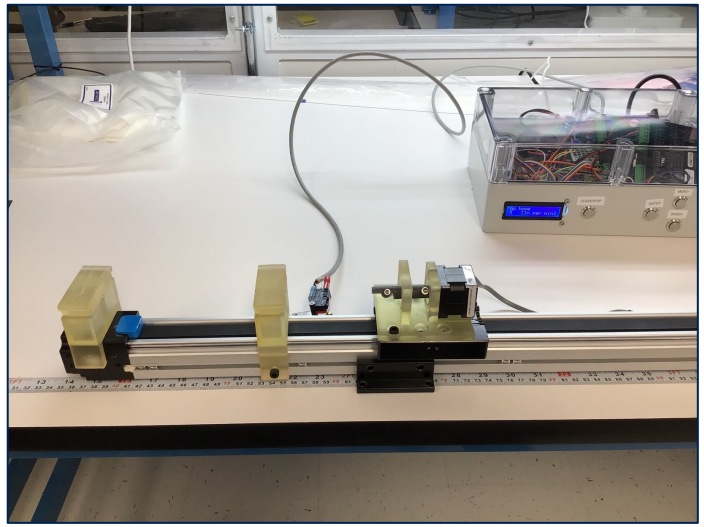
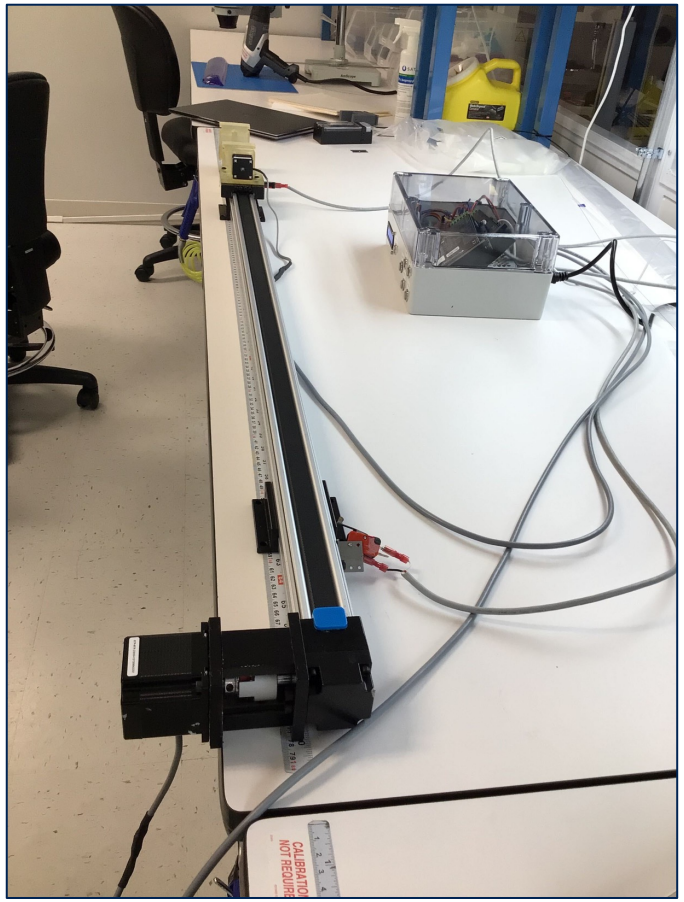
Impeller trimming fixture



Linear Coil Winder

- Need:
  - Multiple processes require it & takes a lot of time (bottle neck)
- Challenges:
  - Sourcing parts
  - Running two stepper motors at different speed at the same time
  - Cable management
  - Documentation
  - Validating against existing winder





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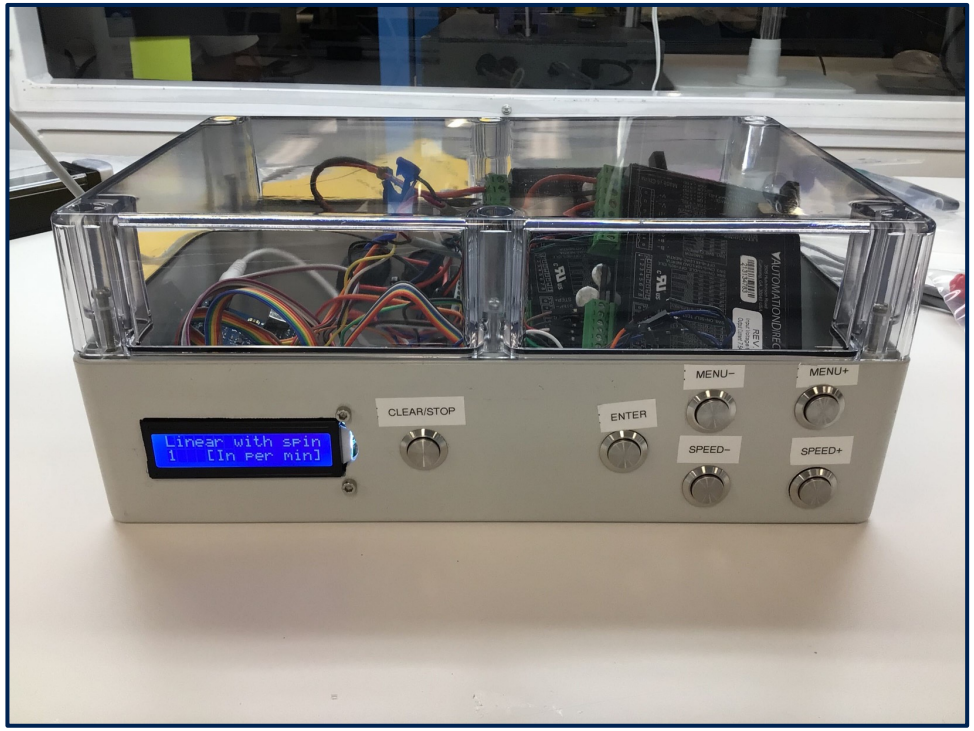
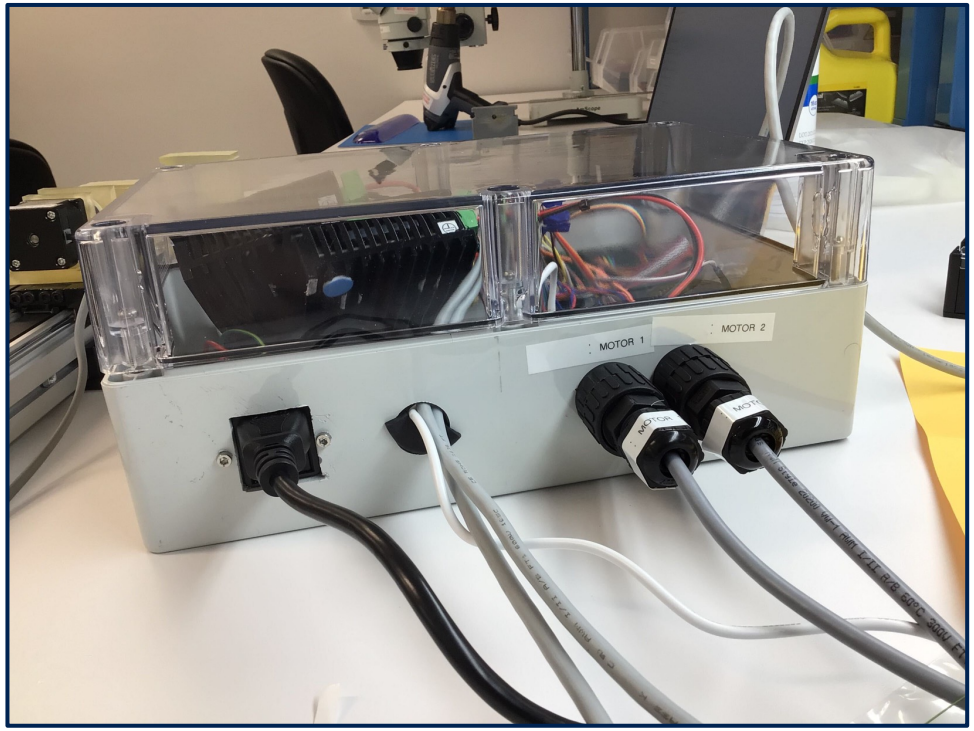
Linear Coil Winder

- Results:
  - Design improvement
  - Operators buy in was a success
  - Currently ready for use by the operators
  - Efficient coding





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Takeaways

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What I've learned

- Observed and learned the stage of a startup
- From DV to first in human
- A deeper understanding of R&D, Process development and operations work
- Efficiency is important
- Avoiding measurement mistakes
- Tips and tricks on everyday task or long-term tasks

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